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10/645,952	08/22/2003	Xiao-Fan Feng	SLA1222	8258

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KRIEGER INTELLECTUAL PROPERTY, INC.  
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Vancouver, WA 98687-2438

EXAMINER
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KAU, STEVEN Y

ART UNIT	PAPER NUMBER
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2625

NOTIFICATION DATE	DELIVERY MODE
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07/15/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

KRIEGERIP@COMCAST.NET

<b>Office Action Summary</b>	<b>Application No.</b> 10/645,952	<b>Applicant(s)</b> FENG ET AL.	
	<b>Examiner</b> STEVEN KAU	<b>Art Unit</b> 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2011.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-18 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 is/are allowed.
- 6) ☒ Claim(s) 14-18 and 21-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/17/2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 17, 2011 has been entered.

### ***Response to Amendment***

2. This is in response to Applicant(s) arguments filed on 03/18/2011.

- The following is the current status of claims:

Claims 1-13 and 19 have been cancelled. Claims 14-18 and 20-25 remain pending for examination, with claims 14, 20, 21, 22, 23, 24, and 25 being independent.

- Response to Remarks/Arguments:

(1) Applicant's arguments with respect to claim Rejections under 35

U.S.C. §112, second paragraph, page 12, Remarks, 03/18/2011, with

respect to claim 14 have been fully considered and are persuasive. The

claim rejections under 35 U.S.C. §112, second paragraph is withdrawn from the record.

(2) Applicant's arguments with respect to claims rejections under 35 U.S.C. §102(e) have been fully considered. Applicant filed an affidavit or declaration under 37 CFR 1.132 showing that the reference invention **is not by "another"** on 04/15/2011. Thus, the rejections of claims 14, 15, 18 and 21-25 under 35 USC 102(e) are withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Doherty et al (US 6,795,085) as discussed in the following sections.

### ***Drawing***

3. Figures 1, 2 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawing will not be held in abeyance.



***Specification***

Title of the Invention: The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. See 37 CFR 1.72(a) and MPEP § 606.

The following title is suggested: "SYSTEM AND METHODS FOR DITHER STRUCTURE CREATION FOR REDUCING THE VISIBILITY OF CONTOURING IN A STILL AND VIDEO IMAGE".

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 14, 15, 18, and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al (US 6,795,085) in view of Chen (US 7,256,795).

(1) Regarding claims 14, 22 and 23.

Doherty discloses a method for creating a spatio-temporal array of dither patterns, said method comprising:

- a. establishing a spatio-temporal array of dither pattern tiles comprising a first temporal frameset (**many spatial-temporal dither patterns can be used, col 5, lines 30-33; as an example, digital dithering adds both a random noise value and a "temporal dither" value and a 4x4 spatial pattern in a temporal dither that changes frame-by-frame and repeats every 4 frames, col 5, lines 1-30**), wherein said first temporal frameset comprises a first dither pattern tile and a second dither pattern tile (**referring to Table in col 5, lines 15-24, dither patterns are changed from frame to frame**); and
- b. designating first pixel values in said first dither pattern tile wherein said first pixel values are spatially dispersed from other pixel values in said first dither pattern tile and said first pixel values are spatially dispersed from second pixel values in said second dither pattern tile (**in the embodiment of Fig. 1, error is feedback (or dispersed) to generate a next pixel, col 2, lines 58-60, and in another embodiment, the example discussed above, each frame includes all four dither values and with pixel visiting all four dither values during the four frames, col 5, lines 6-15, and lines 38-48**),

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wherein said designating is performed by a computing device comprising a processor and a memory (**referring to Figs. 1 and 5, error diffusion and dithering circuit is part of an SLM-based display system, col 3, lines 17-27 and col 5, lines 34-37**).

Doherty does not teach that dither pattern tile in a color channel.

Chen teaches that dither pattern tile in a color channel (**referring to Fig. 1, Graphic Controller 14 is capable in operating in a temporal and spatial dithering mode and a temporal dithering mode is to change color pixel in a successive frames and spatial dithering is to display different colored adjacent pixels in a frame, col 4, line 66 to col 5, line 14**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Doherty to include "dither pattern tile in a color channel" as taught by Chen. The motivation for doing so would have been to improve color quality by applying dithering process, col 1, lines 20-29, Chen, and therefore, to enhance the spatial-temporal dithering process of reducing contour and artifacts as specified by Doherty, col 2, lines 8-9; and further it is easily implemented by one or other in the art with a predictable result.

The suggestion for doing so was given by Chen in col 5, lines 12-14 wherein by applying both temporal and spatial dithering, the limited color bandwidth of an LCD can be made to appear more dynamic, for example. Therefore, it would have been obvious to combine Chen with the Doherty to obtain the invention as specified in claim 14.

(2) Regarding claim 15, depending to claim 14.

Doherty discloses that said spatio-temporal array also comprises a second temporal frameset comprising third pixel values and said first pixel values are also spatially dispersed from said third pixel values in said second temporal frameset **(in the embodiment of Fig. 1, error is feedback (or dispersed) to generate a next pixel, col 2, lines 58-60, and in another embodiment, digital dithering adds both a random noise value and a "temporal dither" value and a 4x4 spatial pattern in a temporal dither that changes frame-by-frame and repeats every 4 frames, col 5, lines 1-30, and the example discussed above, each frame includes all four dither values and with pixel visiting all four dither values during the four frames, col 5, lines 6-15, and lines 38-48).**

(3) Regarding claim 18, depending to claim 15.

Doherty discloses that additional temporal framesets and a last temporal frameset wherein pixel values designated in a last temporal frame are considered temporally adjacent to a first temporal frameset wherein said pixel values in said first temporal frame have a dispersion effect on pixels designated in said last frameset **((in the embodiment of Fig. 1, error is feedback (or dispersed) to generate a next pixel, col 2, lines 58-60, digital dithering adds both a random noise value and a "temporal dither" value and a 4x4 spatial pattern in a temporal dither that changes frame-by-frame and repeats every 4 frames, col 5, lines 1-30).**

(4) Regarding claim 21.

Doherty discloses a system for creating a spatio-temporal array of dither patterns, said system comprising:

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a. a spatio-temporal array of dither pattern tiles comprising a plurality of temporal framesets (**col 5, lines 6-15**), each of said framesets comprising a plurality of dither pattern tiles (**dither patterns has a spatial variation as shown in the Table of col 5, lines 6-24**), where said array is stored in a memory (**referring to Fig. 5, illustrates a spatial-temporal dithering unit 50, in which has a memory to save dithering data, col 5, lines 35-48**); and

b. a designator for designating pixel values in said dither pattern tiles wherein said designator designates subsequently-designated pixel values (**in the embodiment of Fig. 1, using feedback with a random noise to generate the next pixel, col 2, lines 58-62, and in another embodiment of Fig. 5, "For each pixel value, source 53 provides a random value and table 54 provides a temporal dither value located in the table by a row, column, and field identifier", col 5, lines 40-42**), in a first dither pattern tile, wherein said subsequently-designated pixel values are spatially dispersed from previously-designated pixel values in said first dither pattern tile and wherein said subsequently-designated pixel values are also dispersed from previously-designated pixel values in dither pattern tiles in another of said color channels, and wherein said designator comprises a processor linked to said memory (**in the embodiment of Fig. 1, error is feedback (or dispersed) to generate a next pixel, col 2, lines 58-60, and in another embodiment, the example discussed above, each frame includes all four dither values and with pixel visiting all four dither values during the four frames, col 5, lines 6-15, and lines 38-48; and also referring to Fig. 5, dither patterns are changed in a frame-by-frame manner, and for each pixel, as discussed above,**

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**random value and temporal dither value are updated and the operation repeats every 4 frames, and the temporal dither table is stored in a memory, col 5, lines 1-48).**

Doherty does not teach spatio-temporal process with a plurality of color channels.

Chen teaches teach spatio-temporal process with a plurality of color channels (referring to Fig. 1, **Graphic Controller 14 is capable in operating in a temporal and spatial dithering mode and a temporal dithering mode is to change color pixel in a successive frames and spatial dithering is to display different colored adjacent pixels in a frame, col 4, line 66 to col 5, line 14).**

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Doherty to include "spatio-temporal process with a plurality of color channels" as taught by Chen. The motivation for doing so would have been to improve color quality by applying dithering process, col 1, lines 20-29, Chen, and therefore, to enhance the spatial-temporal dithering process of reducing contour and artifacts as specified by Doherty, col 2, lines 8-9; and further it is easily implemented by one or other in the art with a predictable result.

The suggestion for doing so was given by Chen in col 5, lines 12-14 wherein by applying both temporal and spatial dithering, the limited color bandwidth of an LCD can be made to appear more dynamic, for example. Therefore, it would have been obvious to combine Chen with the Doherty to obtain the invention as specified in claim 21.

(5) Regarding claims 24 and 25.

Doherty discloses a method for creating a spatio-temporal array of dither patterns, said method comprising:

- a. establishing a first temporal frameset and a second temporal frameset (**Doherty teaches and suggests spatial-temporal processing on a frame-by-frame basis and repeats every 4 frames, col 5, lines 6-15**), wherein said framesets comprise dither pattern tiles (**"Many other spatial-temporal dither patterns could be used. For example, the number of dither values, the block size and shape, the temporal frequency, and the pattern within each block are all variable", col 5, lines 30-34**);
- b. designating pixel values at locations in a first dither pattern tile of said first temporal frameset, wherein said locations are dispersed from locations of other pixel values in said first temporal frameset and said second temporal frameset (**in the embodiment of Fig. 1, using feedback with a random noise to generate the next pixel, col 2, lines 58-62, and in another embodiment of Fig. 5, "For each pixel value, source 53 provides a random value and table 54 provides a temporal dither value located in the table by a row, column, and field identifier", col 5, lines 40-42**), wherein said designating is performed by a computing device comprising a processor and a memory (**referring to Figs. 1 and 5, error diffusion and dithering circuit is part of an SLM-based display system, col 3, lines 17-27 and col 5, lines 34-37**);
- c. designating pixel values at locations in a second dither pattern tile of said first temporal frameset, wherein said locations are dispersed from locations of other pixel values in said first temporal frameset and said second temporal frameset (**in the embodiment of Fig. 1, using feedback with a random noise to generate the next**

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**pixel, col 2, lines 58-62, and in another embodiment of Fig. 5, "For each pixel value, source 53 provides a random value and table 54 provides a temporal dither value located in the table by a row, column, and field identifier", col 5, lines 40-42), wherein said designating is performed by said computing device (referring to Figs. 1 and 5, error diffusion and dithering circuit is part of an SLM-based display system, col 3, lines 17-27 and col 5, lines 34-37).**

Doherty does not teach spatio-temporal process with a plurality of color channels.

Chen teaches teach spatio-temporal process with a plurality of color channels **(referring to Fig. 1, Graphic Controller 14 is capable in operating in a temporal and spatial dithering mode and a temporal dithering mode is to change color pixel in a successive frames and spatial dithering is to display different colored adjacent pixels in a frame, col 4, line 66 to col 5, line 14).**

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Doherty to include "spatio-temporal process with a plurality of color channels" as taught by Chen. The motivation for doing so would have been to improve color quality by applying dithering process, col 1, lines 20-29, Chen, and therefore, to enhance the spatial-temporal dithering process of reducing contour and artifacts as specified by Doherty, col 2, lines 8-9; and further it is easily implemented by one or other in the art with a predictable result.

The suggestion for doing so was given by Chen in col 5, lines 12-14 wherein by applying both temporal and spatial dithering, the limited color bandwidth of an LCD can



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be made to appear more dynamic, for example. Therefore, it would have been obvious to combine Chen with the Doherty to obtain the invention as specified in claims 22 and 25.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al (US 6,795,085) in view of Chen (US 7,256,795) as applied to claim 15, and in view of Lippel (US 4,758,893).

(6) Regarding claim 16, in accordance with claim 15.

Doherty discloses wherein said dispersion from said third pixel values in said second temporal frameset wherein temporal frames more temporally distant from a said first pixel values have a lower dispersion than closer temporal frames **(in the embodiment of Fig. 1, error is feedback (or dispersed) to generate a next pixel, col 2, lines 58-60, and in another embodiment, the example discussed above, each frame includes all four dither values and with pixel visiting all four dither values during the four frames, col 5, lines 6-15, and lines 38-48).**

Doherty does not explicitly disclose that weighted frameset.

Lippel' 893 discloses weighted frameset (e.g. **Lippel discloses weighted temporal frames for subcycling cinematic dither and therefore, temporal instant of temporal frames can be controlled, col 10, lines 13-24).**

Having a method of Doherty reference and then given the well-established teaching of Lippel' 893 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Doherty

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reference to include weighted frameset as taught by Lippel' 893 reference since doing so would be able to control priority of color channels in the method for creating a spatio-temporal array of the dither patterns and further the services provided could easily be established for one another with predictable results.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doherty et al (US 6,795,085) in view of Chen (US 7,256,795) as applied to claim 14, and in view of Masuji et al (US 7,110,010).

(7) Regarding claim 17, in accordance with claim 15.

Doherty discloses that wherein said dispersion from said second pixel values (**in the embodiment of Fig. 1, error is feedback (or dispersed) to generate a next pixel, col 2, lines 58-60, and in another embodiment, the example discussed above, each frame includes all four dither values and with pixel visiting all four dither values during the four frames, which are repeated every 4 frames, col 5, lines 6-15, and lines 38-48).**

Doherty does not explicitly disclose that pixel value in color channel is weighted.

Masuji' 010 teaches that pixel value in color channel is weighted (**Masuji' 010 discloses that dither coefficient is weighted with color gradation level and dither coefficient is selected for dithering process, col 4, lines 23-39 and col 14, lines 17-33, and Fig. 17).**

Having a method of Doherty reference and then given the well-established teaching of Masuji' 010 reference, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to modify the method of Doherty reference to include "pixel value in color channel is weighted" taught by Masuji' 010 reference since doing so would enhance the method for creating a spatio-temporal array of the dither patterns by selecting different weight level of dither coefficient to optimize dither coefficient patterns and further the services provided could easily be established for one another with predictable results.

### ***Allowable Subject Matter***

9. Claim 20 is allowable. The primary reasons for allowance for claim 20 is the inclusion of the limitation of a method for creating a spatio-temporal array of dither patterns such (a). establishing an initial temporal offset frameset (ITOF), wherein said ITOF comprises a pre-determined pattern for each of a plurality of color channels; (b). establishing a first temporal frameset comprising dither pattern tiles for each of a plurality of color channels; (c). designating a first pixel value at a first point in a first dither pattern tile of said first temporal frameset, wherein said first point is dispersed from at least one pixel value in said pre-determined pattern, wherein said designating is performed by a computing device comprising a processor and a memory; (d). designating a second pixel value at a second point in said first dither pattern tile of said first temporal frameset, wherein said second point is placed at a location that is dispersed away from at least one pixel value in said first dither pattern tile, wherein said designating is performed by said computing device, and repeating steps of designating pixel value in said multiple dither pattern tiles until all frames of subsequent temporal

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framesets have been designated. It is these limitations either alone or combined as claimed that were taught, found, or suggested by prior arts in the record. The closest prior arts in the record are Doherty et al (US 6,795,085), Chen (US 7,256,795), Lippel (US 4,758,893) and Gupta et al (Gupta) (US 6,851,783).

### ***CONTACT INFORMATION***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Kau whose telephone number is 571-270-1120 and fax number is 571-270-2120. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/STEVEN KAU/  
Examiner, Art Unit 2625  
July 10, 2011

